

Students Like Learning Mathematics Scale, Fourth Grade

The Students Like Learning Mathematics (SLM) scale was created based on students' degree of agreement with the nine statements described below.

Items in the TIMSS 2015 Students Like Learning Mathematics Scale, Fourth Grade

		How much do you agree with these statements about learning mathematics?			
		Agree a lot	Agree a little	Disagree a little	Disagree a lot
T	ASBM01A	1) I enjoy learning mathematics -----○	○	○	○
T	ASBM01B*	2) I wish I did not have to study mathematics* -----○	○	○	○
T	ASBM01C*	3) Mathematics is boring* -----○	○	○	○
T	ASBM01D	4) I learn many interesting things in mathematics ---○	○	○	○
T	ASBM01E	5) I like mathematics -----○	○	○	○
	ASBM01F	6) I like any schoolwork that involves numbers -----○	○	○	○
	ASBM01G	7) I like to solve mathematics problems-----○	○	○	○
	ASBM01H	8) I look forward to mathematics lessons -----○	○	○	○
	ASBM01I	9) Mathematics is one of my favorite subjects -----○	○	○	○

* Reverse coded

T Trend item—item was included in the same scale in TIMSS 2011 and was used for linking the TIMSS 2011 and TIMSS 2015 scales.

Item Parameters for the TIMSS 2015 Students Like Learning Mathematics Scale, Fourth Grade

Item	delta	tau_1	tau_2	tau_3	Infit
ASBM01A	-0.36154	-0.78229	-0.58169	1.36398	0.78
ASBM01B*	0.16159	-0.46676	-0.01626	0.48302	1.72
ASBM01C*	0.12982	-0.82103	0.11530	0.70573	1.39
ASBM01D	-0.81796	-0.82855	-0.37351	1.20206	1.18
ASBM01E	-0.19078	-0.58243	-0.43159	1.01402	0.65
ASBM01F	0.03849	-1.25798	-0.21189	1.46987	1.05
ASBM01G	0.15055	-0.96095	-0.26596	1.22691	1.06
ASBM01H	0.41364	-1.10049	-0.23780	1.33829	0.84
ASBM01I	0.47619	-0.62831	-0.10305	0.73136	0.91

*Reverse coded

Scale Transformation Constants for the TIMSS 2015 Students Like Learning Mathematics Scale, Fourth Grade

Scale Transformation Constants	
A = 8.402636	Transformed Scale Score = 8.402636 + 1.047479 • Logit Scale Score
B = 1.047479	

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

**Equivalence Table of Raw and Transformed Scale Scores for the TIMSS
2015 Students Like Learning Mathematics Scale, Fourth Grade**

Raw Score	Transformed Scale Score	Cutpoint
0	4.40782	
1	5.53183	
2	6.06393	
3	6.42611	
4	6.71073	
5	6.94947	
6	7.15899	
7	7.34756	
8	7.52392	
9	7.68976	
10	7.84785	
11	8.00037	
12	8.14916	
13	8.29582	8.3
14	8.44192	
15	8.58902	
16	8.73889	
17	8.89348	
18	9.05518	
19	9.22676	
20	9.41034	
21	9.61310	
22	9.84154	
23	10.10678	10.1
24	10.42683	
25	10.83982	
26	11.43903	
27	12.65794	

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015



Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2015 Students Like Learning Mathematics Scale, Fourth Grade

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item								
			ASBM01A	ASBM01B*	ASBM01C*	ASBM01D	ASBM01E	ASBM01F	ASBM01G	ASBM01H	ASBM01I
Australia	0.93	66	0.88	0.67	0.77	0.70	0.91	0.76	0.82	0.89	0.86
Bahrain	0.89	55	0.79	0.47	0.52	0.76	0.87	0.69	0.80	0.82	0.83
Belgium (Flemish)	0.93	65	0.89	0.78	0.82	0.64	0.92	0.78	0.70	0.82	0.86
Bulgaria	0.92	63	0.86	0.52	0.68	0.74	0.89	0.83	0.88	0.84	0.85
Canada	0.93	64	0.87	0.63	0.74	0.70	0.91	0.77	0.81	0.87	0.85
Chile	0.91	59	0.84	0.58	0.68	0.69	0.88	0.71	0.83	0.84	0.83
Chinese Taipei	0.95	70	0.88	0.75	0.74	0.79	0.92	0.84	0.85	0.88	0.87
Croatia	0.93	66	0.89	0.71	0.82	0.68	0.92	0.82	0.61	0.92	0.86
Cyprus	0.93	64	0.86	0.70	0.70	0.73	0.89	0.77	0.79	0.87	0.85
Czech Republic	0.93	66	0.90	0.65	0.79	0.63	0.92	0.81	0.73	0.91	0.89
Denmark	0.94	67	0.86	0.70	0.81	0.77	0.90	0.76	0.85	0.87	0.82
England	0.93	66	0.87	0.72	0.80	0.68	0.91	0.77	0.77	0.90	0.85
Finland	0.93	65	0.86	0.68	0.82	0.78	0.91	0.81	0.67	0.86	0.85
France	0.91	59	0.87	0.65	0.76	0.68	0.89	0.70	0.67	0.83	0.84
Georgia	0.84	47	0.78	0.36	0.37	0.69	0.85	0.70	0.75	0.71	0.74
Germany	0.93	66	0.88	0.73	0.73	0.71	0.92	0.81	0.76	0.90	0.87
Hong Kong SAR	0.94	67	0.86	0.65	0.74	0.79	0.91	0.83	0.84	0.86	0.86
Hungary	0.93	63	0.87	0.65	0.72	0.69	0.90	0.81	0.74	0.88	0.84
Indonesia	0.75	40	0.72	0.31	0.39	0.66	0.81	0.69	0.43	0.70	0.74
Iran, Islamic Rep. of	0.83	46	0.77	0.47	0.44	0.63	0.83	0.53	0.79	0.72	0.80
Ireland	0.92	63	0.87	0.66	0.75	0.67	0.91	0.78	0.76	0.88	0.83
Italy	0.93	63	0.88	0.73	0.79	0.63	0.90	0.77	0.68	0.88	0.86
Japan	0.94	67	0.89	0.60	0.73	0.76	0.91	0.82	0.85	0.89	0.85
Jordan	0.83	50	0.71	0.30	0.36	0.75	0.86	0.74	0.80	0.82	0.77
Kazakhstan	0.83	47	0.62	0.36	0.56	0.63	0.80	0.71	0.77	0.80	0.78
Korea, Rep. of	0.94	67	0.86	0.63	0.80	0.77	0.91	0.85	0.86	0.83	0.85
Kuwait	0.87	54	0.80	0.30	0.46	0.76	0.87	0.74	0.82	0.84	0.80
Lithuania	0.92	61	0.85	0.66	0.67	0.59	0.89	0.81	0.86	0.85	0.80
Morocco	0.75	41	0.66	0.27	0.31	0.68	0.79	0.70	0.70	0.76	0.66
Netherlands	0.93	63	0.85	0.71	0.78	0.65	0.90	0.76	0.82	0.85	0.81
New Zealand	0.93	66	0.88	0.70	0.75	0.71	0.90	0.79	0.84	0.87	0.85
Northern Ireland	0.92	62	0.87	0.65	0.75	0.66	0.90	0.79	0.74	0.88	0.83
Norway (5)	0.94	68	0.86	0.66	0.82	0.75	0.91	0.81	0.86	0.87	0.85
Oman	0.77	41	0.69	0.33	0.39	0.62	0.79	0.64	0.76	0.65	0.75
Poland	0.93	65	0.88	0.71	0.78	0.73	0.91	0.78	0.87	0.72	0.85
Portugal	0.92	63	0.87	0.72	0.75	0.66	0.90	0.76	0.79	0.85	0.83
Qatar	0.89	55	0.80	0.44	0.52	0.77	0.87	0.74	0.79	0.80	0.82
Russian Federation	0.89	56	0.84	0.45	0.70	0.67	0.87	0.75	0.73	0.84	0.82
Saudi Arabia	0.87	54	0.78	0.34	0.40	0.79	0.87	0.75	0.83	0.85	0.80
Serbia	0.93	65	0.86	0.65	0.75	0.71	0.91	0.79	0.79	0.90	0.83
Singapore	0.93	64	0.86	0.75	0.75	0.72	0.89	0.73	0.81	0.84	0.85
Slovak Republic	0.92	62	0.87	0.65	0.73	0.58	0.89	0.75	0.82	0.90	0.85
Slovenia	0.93	66	0.86	0.65	0.78	0.76	0.91	0.77	0.81	0.91	0.84
South Africa (5)	0.77	39	0.70	0.26	0.33	0.60	0.79	0.67	0.67	0.67	0.72
Spain	0.91	59	0.83	0.59	0.74	0.64	0.88	0.70	0.77	0.85	0.84
Sweden	0.93	67	0.85	0.68	0.85	0.72	0.91	0.83	0.77	0.87	0.83
Turkey	0.84	48	0.78	0.54	0.65	0.40	0.83	0.62	0.74	0.77	0.79
United Arab Emirates	0.89	56	0.80	0.52	0.65	0.74	0.86	0.69	0.79	0.79	0.81
United States	0.93	65	0.88	0.66	0.75	0.71	0.91	0.76	0.86	0.87	0.85
Benchmarking Participants											
Buenos Aires, Argentina	0.91	60	0.84	0.54	0.64	0.68	0.89	0.78	0.81	0.85	0.85
Ontario, Canada	0.93	65	0.88	0.66	0.74	0.70	0.91	0.76	0.83	0.88	0.85
Quebec, Canada	0.91	60	0.84	0.56	0.76	0.69	0.89	0.74	0.73	0.87	0.82
Norway (4)	0.93	66	0.87	0.60	0.79	0.74	0.91	0.79	0.86	0.89	0.83
Abu Dhabi, UAE	0.89	55	0.79	0.48	0.60	0.75	0.85	0.71	0.80	0.80	0.80
Dubai, UAE	0.91	58	0.84	0.60	0.71	0.71	0.87	0.68	0.78	0.79	0.84
Florida, US	0.93	65	0.87	0.65	0.74	0.70	0.90	0.77	0.88	0.86	0.83

*Reverse coded

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

Relationship Between the TIMSS 2015 Students Like Learning Mathematics Scale, Fourth Grade, and TIMSS 2015 Mathematics Achievement

Country	Pearson's Correlation with Mathematics Achievement		Variance in Mathematics Achievement Accounted for by Difference Between Regions of the Scale (η^2)
	(r)	(r^2)	
Australia	0.19	0.04	0.03
Bahrain	0.21	0.04	0.05
Belgium (Flemish)	0.10	0.01	0.01
Bulgaria	0.22	0.05	0.04
Canada	0.21	0.04	0.04
Chile	0.19	0.04	0.04
Chinese Taipei	0.21	0.05	0.04
Croatia	0.14	0.02	0.02
Cyprus	0.18	0.03	0.04
Czech Republic	0.17	0.03	0.02
Denmark	0.17	0.03	0.03
England	0.12	0.02	0.02
Finland	0.20	0.04	0.03
France	0.19	0.04	0.03
Georgia	0.22	0.05	0.04
Germany	0.16	0.03	0.03
Hong Kong SAR	0.22	0.05	0.04
Hungary	0.20	0.04	0.03
Indonesia	0.24	0.06	0.06
Iran, Islamic Rep. of	0.23	0.05	0.05
Ireland	0.17	0.03	0.03
Italy	0.13	0.02	0.01
Japan	0.30	0.09	0.09
Jordan	0.25	0.06	0.06
Kazakhstan	0.15	0.02	0.02
Korea, Rep. of	0.33	0.11	0.10
Kuwait	0.18	0.03	0.04
Lithuania	0.16	0.02	0.02
Morocco	0.29	0.09	0.08
Netherlands	0.18	0.03	0.03
New Zealand	0.05	0.00	0.00
Northern Ireland	0.18	0.03	0.03
Norway (5)	0.10	0.01	0.02
Oman	0.26	0.07	0.06
Poland	0.13	0.02	0.02
Portugal	0.28	0.08	0.07
Qatar	0.21	0.04	0.05
Russian Federation	0.22	0.05	0.04
Saudi Arabia	0.21	0.04	0.05
Serbia	0.10	0.01	0.01
Singapore	0.23	0.05	0.05
Slovak Republic	0.07	0.01	0.00
Slovenia	0.19	0.03	0.03
South Africa (5)	0.32	0.10	0.12
Spain	0.13	0.02	0.02
Sweden	0.07	0.00	0.00
Turkey	0.26	0.07	0.06
United Arab Emirates	0.19	0.03	0.04
United States	0.16	0.02	0.02
International Median	0.19	0.04	0.03
Benchmarking Participants			
Buenos Aires, Argentina	0.06	0.00	0.01
Ontario, Canada	0.21	0.04	0.04
Quebec, Canada	0.18	0.03	0.03
Norway (4)	0.17	0.03	0.03
Abu Dhabi, UAE	0.21	0.04	0.05
Dubai, UAE	0.16	0.02	0.02
Florida, US	0.19	0.04	0.04

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015